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Chloroform Anaesthesia in Menagerie Patients.*

By Professor G. H. WOOLDRIDGE, F.R.C.V.S., F.Z.S.

The anæsthetisation of menagerie patients involves no principles that do not apply equally well with regard to the domesticated animals. It does, however, present more or less serious difficulties that are not met with in every-day veterinary practice.

These are mainly concerned with the methods of restraint and with the fact that, with such a wide range of unusual subjects, one is much less familiar with their idiosyncrasies, both as species and as individuals. This is the case to such a degree that one often hesitates before deciding to administer chloroform to some patients and, at times, one actually is afraid and refuses the responsibility of doing so, regarding the alternative risks, great as they may be, as being the less.

A striking example of this occurred in connection with an aged reticulated python, no less than 27 feet long and having a girth greater than my thigh, which had broken its jaw in the attempt to swallow a small goat. The jaw had to be set and put in plaster. The snake was a very valuable one, and, as I was not ashamed to confess my ignorance of the way this type of creature behaved to chloroform, it was decided not to risk it and the operation was quite successfully carried through without it, the plaster and bandages being removed and re-applied twice subsequently before being finally discarded.

The necessity for anæsthesia also arises in cases that would not call for it in domesticated animals that can be easily handled, such as for the examination of various parts affected with lesions, the nature of which could otherwise only be guessed at; one may instance an injured eye of a lynx, an injured arm in a bear, a swelling on the body of a wombat. Some of the manipulations or operations themselves would not have necessitated anæsthesia in docile animals, and, although they may sound to be absurdly simple, they are by no means as simple as they sound. Examples are furnished by the following cases:—Dressing the eyes of an armadillo with conjunctivitis; removing a chain collar from a tigress; cutting ingrowing claws of bears, tigers and jaguars; rasping the teeth of a kiang; passing the catheter in a zebra; applying dressings for skin disease; and the dressing of wounds such as amputated digits of a hyena.

* Read before the Central Veterinary Society.

As in the case of the domesticated animals, different methods of restraint and administration are adopted according to the type of patient. A few of the animals can be handled fairly easily, and in such cases we find it best to use similar methods as in general practice. For example, in a zebra, with patience hobbles can often be applied and the animal cast and the chloroform administered by the Cox inhaler as for horses.

Most of the *larger animals*, however, have to be driven or coaxed by food after fasting, into a specially constructed and very strong box, iron bound, with sliding doors at each end and an additional one in the middle that can be used if necessary. Two or three plate glass observation windows are provided and protected on the inner side by stout bars. The window on the top is hinged so that it can be opened for the admission of air if necessary, and also for clearer observation. Chloroform vapour is pumped into the box by means of a foot pump which drives the air either through a sponge in a small box attached to the side of the large box, or through chloroform in a wash bottle and on into the chamber. The sponge method is decidedly the slower and the more wasteful, and it sometimes takes half-an-hour before anæsthesia is established. The slower induction, however, is not always an objection, as it is also generally safer. If it seems too slow, some additional chloroform may be poured on to cotton wool and placed inside the top window, resting on the inner bars. Of the two methods I prefer the wash-bottle.

Much patience and very careful observation are essential to safety by this method, in order to obtain safe and effective anæsthesia. It is impossible to test the reflexes, and one is guided entirely by the characters of the respiration and the posture and movement or otherwise of the patient. When the animal is considered safely under, one of the sliding doors is opened a little and a pair of long pincer-like forceps is introduced and a part of the patient is grasped—a leg or tail usually—and drawn just outside and then grasped by the hand. By this time it is easily seen if anæsthesia is complete, and, if so, the animal, or that portion or limb to be operated upon, is drawn out and attended to. It is not often necessary to take the whole animal out, nor is it safe, since he may suddenly revive or partially so and do serious damage. Unless the head is out, more chloroform can be pumped into the box to maintain unconsciousness, and as copious air is now being

admitted through the partly-open door it is usually a safe proceeding.

Danger to the patient is generally indicated by jerky, irregular respiration, and sometimes by sudden cessation of breathing. In such cases the pumping is immediately stopped and more air admitted, and the animal prodded with some blunt implement. Ammonia or amyl nitrite is held to his nose on long forceps. It may be necessary to draw the patient almost completely from the box and to drop a few minims of dilute hydrocyanic acid between the lips, but great vigilance is necessary in case he recovers very rapidly, when he is quickly returned to the box and the administration cautiously proceeded with. Danger is experienced in two types of patient, viz., those that go under very quickly, and those that are more than usually resistant at first and consequently take a large total amount of chloroform.

This is the method we have found most suitable for such animals as the lion, tiger, bear, hyena, jaguar, tapir, kiang, serval, buck, porcupine, etc. A smaller improvised box may be used for some of the smaller vicious beasts.

Other small animals, particularly monkeys, have to be caught in a net on a hoop and stick, the mouth of which is then twisted to prevent the patient escaping. When in this situation the open method is best, using a wire frame, over which muslin is spread and the chloroform dropped on from a drop bottle. In cases that can be taken out of the net or otherwise caught and handled, masks of various sizes are used, and made of either soft leather, rubber sheeting, or even stout paper, and placed over the face, as is the usual method with dogs. The chloroform may be pumped in by the rubber pump, or dropped on to cotton wool in the mouth of the mask.

For still smaller animals, the bell-jar has been found to be a very excellent instrument, lending itself to easy observation, the chloroform, ℥xx.-xxx. being introduced on cotton wool. We have used ether ℥i. in a few such cases, but the stage of excitement was usually so much longer and more severe, that it was not persevered with.

The amount of chloroform necessary, as might be expected, varies enormously, and especially so in the box methods. One bear took ℥vi., one ℥ivss. and none of them took less than ℥iv., and even then none of the bears were properly or completely anæsthetised. A lioness required ℥iv., while the amount required for tigers varied from ℥ii. to ℥iv. A lynx required ℥iii. and a black jaguar was well under with ℥ii.½. A remarkable variation was observed in tapirs, one being well under for the examination and dressing of an ulcerated tongue with ℥iiss., while another required ℥viii. for the reduction of a prolapsed rectum. The latter beast was very difficult to get under and then suddenly respiration ceased, but was satisfactorily restored. A zebra was well anæsthetised by ℥i. in a Cox inhaler.

In conjunction with my colleague, Mr. B. Gorton (now Professor Gorton), to whom I am very much indebted for his valuable assistance, both in the administration of the chloroform and in the taking of notes on the cases, I have anæsthetised very considerable numbers of menagerie patients and have come to the conclusion that, with proper care, they are reasonably good subjects for chloroform. Perhaps an exception might be made with regard to the wild ruminants: one roe-buck and two sheep having died of pneumonia, the former after two days, one sheep next day and the other sheep three days later. Curiously, in two of these cases the anæsthesia was for operation on an eye and was induced by mask.

We have *data* concerning eighty-six consecutive administrations, the patients including a very wide range of types and for very diverse operations.

Of these, three animals died *during* the administration and apparently from the effects of the chloroform. One was a monkey with injuries and was found on *post-mortem* to have dilatation of the heart. The other two were a yellowbaboon and a pine marten. In all three cases the chloroform was administered by the mask.

A mongoose, with a necrotic nasal bone, anæsthetised in a bell jar, died during an operation, and, on *post-mortem*, revealed a ruptured liver, no doubt sustained by struggling before being anæsthetised. Other deaths following anæsthesia, and possibly due to it, were the two sheep and the roebuck already referred to, all from pneumonia.

Four other deaths only have to be referred to:—An arctic fox, with suppurating wounds, died next day from septicæmia; a Tasmanian devil, with an injured tarsus, died next day with nephritis; and an Azara's dog, with *prolapsus ani*, died the day after operation with an intussusception. None of the three latter cases could be attributed to the chloroform. The last death was of a bear, chloroformed for operation on the eyes for complete cataracts. For such a delicate operation, deep anæsthesia was essential, and the patient was unusually resistant and was a long time going under. Eventually he appeared to be well under and was being drawn from the box, with the intention of applying a mask to maintain anæsthesia, when he suddenly appeared to be recovering consciousness. A broad tape double-hitch muzzle was speedily put on his nose for safety, and my helper pulled it as tightly as he could to make sure. At this point we were all anxiously watching his head instead of his respiration and when I looked at his breathing again, I was in time to observe severe inspiratory efforts and a sudden cessation of breathing. All efforts at restoration were futile. In my opinion the animal was unfortunately asphyxiated with the tape muzzle.

Ether. We have used ether vapour for general anæsthesia in a number of cases, but our experiences confirmed our much wider experiences of its use in the domesticated animals and we discarded it. We found, practically constantly, that the period of preliminary excitement was much longer and more severe than that produced by chloroform, and that the nauseating after-effects lasted much longer. In our hands the general efficiency and safety of the chloroform were more satisfactory.

TABULATED LIST OF CONSECUTIVE ADMINISTRATIONS OF CHLOROFORM.

	Animal.	*Operation.*	*Method.*	*Remarks.*
1	Spotted cavy	Wounds sutured	Mask	
2	Hyena	Amputation of digits	Box	
3	Hyena	Dressing foot	Box	
4	Hyena	Dressing foot	Box	
5	Jaguar	Cutting ingrowing claws	Box	
6	Badger	Leg amputated	Mask	
7	Badger	Wound sutured	Mask	Breathing ceased but restored.
8	River hog	Prolapsed rectum amputated	Mask	
9	Himalayan bear	Claws cut	Box	
10	Sheep	Eye removed	Mask	Died 3 days later—pneumonia.
11	Collared mangaby	Necrotic tip of tail amputated	Mask	
12	Black lemur	Necrotic tip of tail amputated	Bell-jar	
13	Black bear	Skin disease dressed	Box	4½ ounces used.
14	Himalayan bear	Wounds dressed	Box	6 ounces used.
15	Lynx	Examination of eye	Box	
16	Lemur	Necrotic tip of tail amputated	Mask	
17	Serval	Compound fracture of tibia Wound dressed and splint applied.	Box	Destroyed two days later.
18	Arctic fox	Dressing infected wounds of arm	Mask	Died next day from septicæmia.
19	Red fox	Digit amputated	Mask	
20	Mongoose	Eye removed	Rubber mask	
21	Agouti	Abscess opened	Mask	
22	Agouti	Abscess dressed	Mask	
23	Agouti	Abscess dressed	Mask	
24	Porcupine	Ulcerated swellings of tarsus dressed.	Box	
25	Porcupine	Ulcerated swellings of tarsus dressed.	Box	
26	Porcupine	Ulcerated swellings of tarsus dressed.	Box	Breathing ceased but restored.
27	Burnett's cercopethique.	Arm amputated	Mask	
28	Porcupine	Ulcers of tarsus dressed	Box	
29	Pig-tailed macaque	Wound of hip sutured	Mask	
30	Patas cercopethique.	Necrotic tail amputated	Mask	
31	Marmoset	Arm amputated	Bell-jar	
32	Civet cat	Injury to paw dressed	Mask	
33	Zebra	Catheter passed	Cox inhaler	1 ounce used.
34	Lynx	Abscess of ear dressed	Box	3 ounces used.
35	Tasmanian devil	Injured tarsus dressed	Mask	Died next day—nephritis.
36	Himalayan bear	Claws cut	Box	4 ounces used.
37	Palm civet	Necrotic tail amputated	Mask	
38	Genet	Abscess of face examined. Bone in mouth found and removed	Mask	
39	Dasyure	Cysts opened	Mask	
40	Ferret	Injury to head	Bell-jar	
41	Armadillo	Examination of eyes—conjunctivitis	Box	
42	Mongoose	Necrotic nasal bone	Bell-jar	Died during operation. Ruptured liver found on P.M.E.
43	Skunk	Molar teeth extracted	Bell-jar	
44	Palm civet	Necrotic tail amputated	Bell-jar	
45	Lioness	Ingrowing claws cut	Box	4 ounces used.
46	Tapir	Prolapsed rectum reduced	Box	
47	Tapir	Recurrent prolapsed rectum reduced and sutured.	Box	Very slow going under; 8 ounces used. Breathing ceased but restored.
48	Opossum	Injured tail amputated	Bell-jar	
49	Mongoose lemur	Wounds dressed	Bell-jar	
50	Himalayan bear	Claws cut	Box	
51	Black bear	Arm examined	Box	
52	Roebuck	Purulent ophthalmia	Mask	
53	Roebuck	Purulent ophthalmia	Mask	Died two days later—pneumonia.
54	Pine marten	Tumours	Mask	Died one minute after commencement of administration.
55	Tapir	Ulcerated tongue examined	Box	2½ ounces used.
56	Kiang	Teeth rasped	Boxed	
57	Tigress	Chain collar removed	Box	4 ounces used.
58	Macaque	Injuries dressed	Mask	
59	Woolly monkey	Fractured femur	Mask	
60	Moustached cercopethique	Necrotic tail amputated	Mask	
61	Moustached cercopethique	Injury to arm dressed	Mask	
62	Lemur	Amputation of forearm at elbow	Mask	

	Animal.	*Operation.*	*Methods.*	*Remarks.*
63	Lemur	Operation wound dressed ...	... Mask	
64	Lemur	Operation wound dressed ...	... Mask	
65	Wombat	Swellings examined... ...	... Mask	
66	Common macaque	Necrotic tip of tail amputated	... Mask	
67	Black wallaroo ...	Extraction of teeth ...	... Box	2 ounces used.
68	Patas cercopethique	Necrotic tip of tail amputated	... Mask	
69	Urial sheep ...	Extraction of molar ...	... Mask	Died next day—pneumonia.
70	Azara's dog ...	Prolapsus	... Mask	Died next day—intussusception.
71	Tigress	Ingrowing claws cut ...	... Box and wash bottle.	Quickly under.
72	? Monkey ...	Injured tail	... Mask	
73	Rhesus monkey ...	Injuries	... Mask	Died during administration. P.M.—dilatation of heart.
74	Black buck ...	Prolapsed vagina reduced ...	... Box	
75	Ferret	Abscess	... Bell-jar ...	
76	Ferret	Abscess	... Bell-jar ...	½ drachm used.
77	Schmidt's cercopethique	Injured tail amputated ...	... Mask	
78	Patas cercopethique ...	Injured tail amputated ...	... Mask	
79	Tiger	Ingrowing claws cut ...	... Box	2 ounces used.
80	Black bear ...	Skin dressed	... Box	4 ounces used.
81	Bonnet macaque ...	Necrotic tail amputated ...	... Mask	
82	Black buck ...	Prolapsed vagina reduced ...	... Mask	6 months later than case No. 74.
83	Black jaguar ...	Ingrowing claws cut ...	... Box	2¼ ounces.
84	Capuchin monkey	Amputation of digits ...	... Mask	
85	Yellow baboon ...	Injured tail amputated ...	... Mask	Died under administration.
86	Brown bear ...	For cataracts	... Box	Died. Very resistent to the chloroform. Large amount used, not measured. Tape muzzle applied tightly—collapsed. ? asphyxia.

Discussion.

The President: We are very indebted to Professor Wooldridge for his very interesting paper, but I am afraid very few of us will be able to discuss it.

Captain Kirk: I should like to congratulate Professor Wooldridge on his very interesting paper, but should like to ask him how it was possible that the tape muzzle put on the bear could asphyxiate it, in view of the hard boney case protecting the nasal passages?

Professor Wooldridge: In answer to that question, the asphyxiation of the bear was no doubt due to direct pressure, because the ends of the tape were very tightly drawn and the nasal bones are somewhat flexible. I might mention that I did not tie the tape myself.

Colonel Williams: It might interest Professor Wooldridge to know that, if he ever has to operate on a camel, an intravenous injection of chloral hydrate is a very simple and effective method of producing anæsthesia. During the Great War, Captain Bett, R.A.V.C., reported from Aden that he had performed a number of operations on camels under the influence of chloral hydrate. The dose used was 1½ to 2 ounces dissolved in water and well diluted. The camel is placed in a sitting posture and while under the influence of the drug it does not fall, as is the case of the horse.

I have tried the same method in the horse, using, for a small horse, 1 ounce of chloral hydrate dissolved in 4 ounces of water. There is rapid and complete loss of sensation, and usually after about one hour the animal recovers sufficiently to be able to get up from the casting bed.

Professor MacQueen: In my experience, when one ounce of chloral is given by the mouth, the horse will remain more or less under its influence for twelve to sixteen hours, and I would like to ask Colonel Williams how it was that if the same dose of the drug was given intravenously the horse only remained narcotised for one hour. I consider chloral hydrate useful as a narcotic, but quite unsatisfactory as an anæsthetic, for which, I think, there is nothing to beat chloroform.

Colonel Williams: I did not mean to infer that the effects of the chloral hydrate had completely worn off in one hour, but that the animal had sufficiently recovered to be able to get up and be led away.

Professor Wooldridge: I certainly am very pleased that Colonel Williams referred to the use of intravenous injections of chloral in camels. I have not found it necessary to anæsthetize a camel yet, but if occasion should arise, I shall certainly give a trial to the intravenous injection of chloral hydrate. The objection I have to chloral is that it is an irritant substance, and if any escapes into the tissues it sets up great inflammation of the parts. It is most necessary when given hypodermically that every drop must get into the veins.

I think it quite feasible that the horse, after an intravenous injection given in the proportions as stated by Colonel Williams, would be able to get up even if it was somewhat "groggy," but my experience agrees with that of Professor MacQueen in that the narcotic effects usually last from twelve to eighteen hours.

I have used chloral instead of morphia in dogs with good results, but the stupor lasts somewhat a long time, often from twelve to twenty-four hours. The injection may be given intra-peritoneally, but with this method we get a gelatinous exudate into the peritoneum. I have not found any advantage over morphine in dogs and prefer to use morphine.

British Red Water as found in the North of Scotland.

By W. Rutherford Wallace, M.R.C.V.S., Penicuik, Midlothian.

Red water, as found in the North of Scotland, is a disease of disputed etiology—an enzootic seasonal hæmoglobinuria of female bovines, particularly when parturient, occurring in certain districts, and even on particular farms in such districts, usually accompanied by marked oligocythæmia, icterus and prostration.

Seasonal Incidence.

The majority of cases occur in early spring, while the cows are still housed; a very occasional case is met at grass, and a few cases occur in late autumn, when the cows are once more housed for winter.

Etiology.

Most authorities claim that this Red Water is essentially due to invasion past and present by the Piroplasma bovis (Babesia divergens), and that, when the disease appears after parturition, it is in reality a recrudescence of a pre-existing latent infection. This tick-borne theory is, however, difficult to accept, as the seasonal incidence of the disease is early spring, before the cows are turned out to pasture, and late autumn, when they are again housed for the winter. During the grazing season the disease practically never appears, and this is the period when one would expect the animals to be most exposed to infestation by ticks. Moreover, ticks are very rarely, if ever, found on the affected animals, nor could the pastures be described as "tick pastures." An additional point of some significance is that bullocks appear to enjoy an absolute immunity to Red Water, while they cannot be said to possess even a relative immunity to tick infection.

The examination of blood from the peripheral circulation of affected animals during life fails to reveal the Piroplasm, the only condition in evidence being oligocythæmia, accompanied by the presence of occasional megalocytes, microcytes, poikilocytes, normoblasts, microblasts, megaloblasts, etc. Examination of the heart and splenic blood immediately after slaughter is likewise negative so far as piroplasmosis is concerned.

From this evidence one is at least entitled to dispute the protozoon theory of the disease, and to replace it by a dietetic theory—a hæmolytic toxæmia. The disease appearing chiefly in early spring, one would suspect that the dry condition of the turnips, combined with the depressed vitality associated with parturition, caused some disturbance in bowel metabolism, so rendering the animal organism peculiarly susceptible to attack by some local hæmolytic agent associated with the produce of a particular farm.

Individual idiosyncrasy would also appear to play a part, as only two or three cows in a particular byre may be attacked in one season, the others escaping, perhaps to succumb in the following years. Moreover, one attack does not confer immunity, nor is one justified in claiming that it leaves a predisposition to a subsequent hæmolytic infection.

Since the disease occurs regularly on particular premises, one may suspect that a fungus or bacterium associated with the turnips on these farms has some direct influence in the production of the condition, depressed vitality on the part of the victim giving it a favourable opportunity for attack. The majority of cases—though not all—occur from ten days to eight weeks after parturition, and this physiological phenomenon would, therefore, appear to have some relation, probably predisposing, to the etiology of the disease. Doubtless, also the prolonged period of artificial winter feeding—October to March—plays an important rôle in the causation of the condition, while dietetic errors, including lack of salt in the food to replace that displayed in the blood by the potassium chloride of a vegetable diet, may also be of importance from an etiological point of view.

Further than this it is difficult to surmise, and for the present one must be content with presuming that the disease is a toxæmia, brought about by some specific local hæmolytic agent, probably of dietetic origin, as was claimed many years ago, before the protozoon theory was advanced.

Symptoms.

In the very early stages there is usually fever, accompanied by its classical symptoms, but this rapidly subsides, and the temperature becomes normal or subnormal. The urine is at first distinctly frothy, in a few hours followed by a reddish coloration, later passing through reddish brown and porter colour to black. Accompanying the hæmoglobinuria there is blanching of the mucous membranes, and sometimes signs of icterus are observed in the coloration of the sclerotic conjunctiva. Constipation is usually in evidence, accompanied by a peculiar contraction of the sphincter ani, so that the juices, if not too solid, are voided like a thick wire—this latter appearance being almost pathognomonic in the absence of a sample of urine. On auscultation over the scapula another diagnostic sign is found in the characteristic heart beat, both sounds being of practically equal force and duration, and indistinguishable—anæmic palpitation; indeed, in some cases the heart sounds can be heard, standing behind the animal or even at the byre door. This heart beat, combined with a history of red-coloured urine, can be safely taken as diagnostic, even if the animal is not disposed to proffer a sample of her urine. The appetite throughout the course of the disease may be fastidious, or in complete abeyance, and this, of course, has a distinct bearing on the prognosis. The amount of physical weakness induced is in direct proportion to the course and severity of the attack, modified only by the condition of the appetite, and the animal after about seven to ten days of illness finally succumbs, if it is not previously slaughtered, to join its fellows in some poorly-inspected meat market.

Diagnosis.

Diagnosis is simple, the frothy hæmoglobinuria, icterus, pallid membranes, wiry fæces and anæmic palpitation of the heart being only too sufficient evidence of the condition.

Differential Diagnosis.

The disease should not be confused with hæmaturia, since the latter is not enzootic, and the urine, if allowed to stand, shows a distinct sediment. The hæmorrhagic discharge after parturition is not liable to be confused with the condition, if notice be taken that only the first portion of the urine is coloured ; icterus, wiry fæces, and anæmic cardiac palpitation are likewise absent.

Mortality.

Ninety to 95 per cent. in untreated cases ; 20 to 25 per cent. in treated cases.

Prognosis.

The prognosis depends largely on the time elapsed since parturition, and on the particular symptoms of the affected individual—the condition of the appetite, the particular colour of the urine, and the state of the heart especially, being the guiding factors in formulating the prognosis. If the disease appears in less than ten days after parturition, a fatal termination may be looked for, while if a fortnight has elapsed, the outlook is more hopeful.

Treatment.

Treatment may be summed up as largely symptomatic. A laxative dose of sodium chloride in treacle is given at the outset, and the animal is placed on a laxative, easily digested, nutritious diet, no pains being spared to tempt the appetite, such materials as raw cabbages, turfs from the roadside, green kail, milk, etc. being tried. Turnips are withheld unless boiled, or pared and thoroughly washed. The laxative is followed up by ammonium carbonate and nux vomica in gruel three or four times daily, combined with sodium chloride to induce thirst, keep up the blood pressure, and flush the system. Liq. ferri perchlor. in combination with liq. arsenicalis is administered in gruel twice daily in the hope of replacing some of the disintegrated hæmoglobin, while six ounce doses of whisky three or four times daily are prescribed if the symptoms warrant it. To counteract the increasing weakness, the whisky is administered in the same doses at shorter intervals—every four hours day and night, even though this may have the effect of inducing "twilight sleep." Liq. ammon. acet. does not appear from experience to give equal results to alcohol, nor does spts. æther nit., either alone or in combination, but good bottled stout appears equal in effect to whisky—three bottles three or four times daily at first, later every four hours if required. When the appetite is in complete abeyance, oatmeal gruel and raw eggs are administered with the stimulant. If, after six days of treatment, there is no improvement in the colour of the urine, and the condition of the heart and pulse give warning of approaching dissolution, the animal may be floated to the abattoir, in the hope that it may pass unqualified inspection, or, preferably, it is removed to some outhouse whence it can be conveniently loaded into the knacker's cart, with its quota of the "national beverage" inside it.

In the event of improvement being shown by the change in the urine, the stimulant treatment is continued in decreasing doses for two more days to guard against collapse, while a particularly nutritious diet is prescribed for some time. The intravenous injection of trypan blue, advocated by many authorities, appears absolutely ineffectual in the treatment of the disease, but the intravenous or subcutaneous injection of normal saline solution would appear very rational, but obviously attended with difficulties in a busy practice.

Autopsy.

Anæmia, marked oligochromasia, oligocythæmia, icterus and hydræmia are in evidence. The fat has a characteristic yellowish coloration—hæmochromatosis—which, to the experienced meat inspector, is diagnostic, even in the absence of the contents of the bladder.

Prophylaxis.

No certain preventive measures are known. Salting of the pastures is ineffectual, but the selection and cleansing of the turnips and the administration of salt in the food would appear to be worthy of at least a trial.

Obituary.

W. H. Brown.

We very much regret to have to report the death of Mr. W. H. Brown, which took place on Friday, the 2nd February, in his 73rd year. Mr. Brown was the proprietor of the business known as H. and W. Brown, and was the printer and publisher of the *Veterinary Record* from its inception. On the death of Mr. Hunting, in 1913, he purchased the goodwill of the concern from Mr. Hunting's executors, and carried on the paper until it was finally taken over by the National Veterinary Medical Association. During the Editorship of Mr. Hunting Mr. Brown was not only the business manager of the concern, but Sub-Editor as well. He occasionally contributed abstracts and translations from French Journals, and always took an exceptionally keen interest in the politics of the profession. He himself read all the proofs for many years before Mr. Hunting's death, and was thus fully qualified to take over the Journal and run it successfully on his own all through the very difficult years of the war. It is known to the writer that it was Mr. Brown's own idea, when he assumed full responsibility in 1913, that the Journal should become the property of the profession through the National Veterinary Medical Association, and he did all in his power to facilitate the transfer. The *Veterinary Record* was for thirty years Mr. Brown's pre-occupation, and indeed in the last years it was a burden too heavy for his health. It is not too much to say that the maintenance of the *Veterinary Record* was Mr. Brown's life's work, and the accomplishment of his hopes, when the Journal became the property of the profession, was in the nature of a consolation to him for the years of toil it had occasioned him.

The funeral took place at Brookwood, on Tuesday, the 6th February. Major-General Sir John Moore and Mr. Fred Bullock attended as representing the Royal College of Veterinary Surgeons, and Mr. J. Willett as representing the National Veterinary Medical Association.

The Veterinary Record.

10th February, 1923.

THE GENERAL PRACTITIONER AND RESEARCH.

The position of the general practitioner with regard to research work was mentioned at the last meeting of the Council of the Royal College of Veterinary Surgeons, and there is no doubt that the subject is exercising the minds of many veterinary surgeons at the present time. There is a feeling amongst many who are engaged in country practice that the research-worker (especially if he be acting on behalf of some Committee or Institution) is encroaching on private practice and taking from the private practitioner the testing, inoculating and such like work amongst the herds of his best clients.

The research-worker, on the other hand, complains that he cannot obtain that co-operation from the general practitioner which is essential for the success of his work. We think a little more knowledge on the part of each of the necessities, difficulties and limitations of the work of the other would help greatly towards that co-operation which is so necessary for progress.

There comes a time in the experiments of the laboratory worker, often after months or even years of labour, when these experiments have to stand the test of practical application to animals kept under normal conditions on the land in different parts of the country. To obtain the use of such animals, the research-worker has to enlist the aid of the stock-owner, and he naturally turns to those who are able to keep their stock in as perfect a condition as possible. He may—and often does—obtain the help of the local veterinary surgeon to carry out inoculations, but since his work is limited by the small amount of money that is available to be spent upon it, he cannot afford—in fact, it is impossible for him—to pay high fees. There is often a large amount of work to be done (and done carefully, methodically, and conscientiously if it is to be of any value at all), and long journeys have, frequently, to be made. If the local veterinary surgeon is willing to do the work, he must realise that he is working in the interests of Science and cannot expect adequate monetary reward for his services. Least of all can he expect a fee from the stock-owner who has generously lent his animals and premises for the purposes of the experiment.

On the other hand, there is nothing so much resented by the country practitioner as interference with his practice by another veterinary surgeon. A very large number of veterinary surgeons in country practice would gladly help to carry out research experiments, and would do the work thoroughly and conscientiously, but they cannot afford to do so gratuitously and at the expense of their own practices. We are a poor profession, and the present times bear very hardly on the majority. Quite a number already work exceptionally long hours, being unable to afford the luxury of an assistant, and when all expenses are paid, there is little enough left to live on. With Agriculture in such a depressed condition, it is doubtful how much of the year's earnings will result in cash receipts.

The position is difficult. We suggest that research-workers should state their needs through the medium of this journal, and so obtain voluntary helpers; and further, that they should take every opportunity of giving some indication of their work in a district at the meetings of the local division of the N.V.M.A.

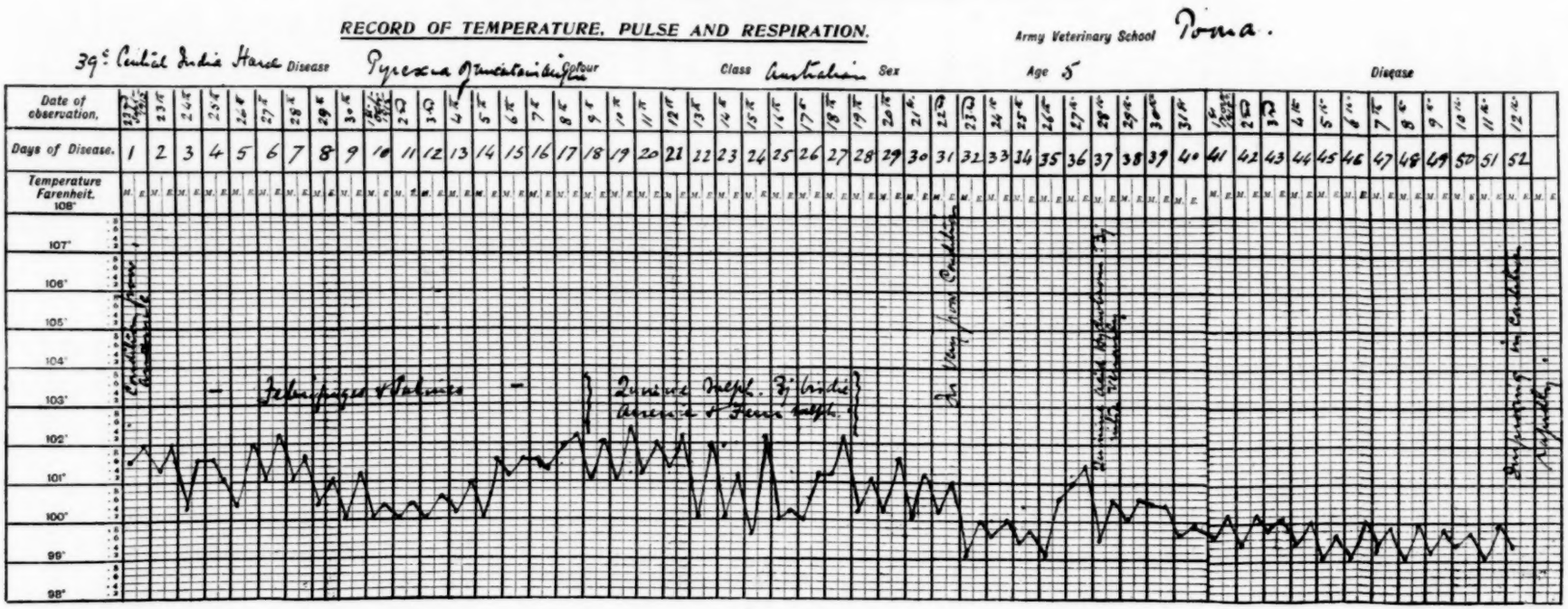
Science must progress, and we should endeavour to do our share in helping forward the scientific aims of our profession. As our knowledge of disease increases, the scope of our work is enlarged, and the experiments of the research-worker of yesterday and to-day will result in the foundation of the greater part of the daily practice and livelihood of the general practitioner of to-morrow. We can be quite sure that research work, far from interfering with private practice, will be of infinite value in increasing it, both in quantity and value.

The Distemper Research Council.

We have before us the appeal for funds issued by *The Field* newspaper on behalf of the Council for Distemper Research, and which, no doubt, has been seen and read by most of our profession. While not criticising the composition of the Council on the lay side, we cannot help commenting on the paucity of professional representation. We think the selection of veterinary representatives might be much strengthened, both in number and in the selection of men who have made a special study of the disease. Unless the number of veterinary surgeons on the Council is increased, we very much doubt if the appeal for funds will receive much support from our profession.

See Report on next page.

Animal treated by Veterinary Assistant in Unit Lines, from 22nd September, 1915, until 28th October, 1915, then sent to Army Veterinary School, Poona, for Quinine Injections.



HISTORY.—A remount from Bombay arrived in April, 1915; in August started losing condition. Arsenic and Iron Tonics given, no improvement; on September 22nd, fever started, temperature up to 102°F. intermittent, never over 102·4°F. Quinine sulph. ℥j. twice daily for 10 days, failed to control the fever; mucous membranes very anæmic; animal in very poor condition. On 28th October, Quinine acid hydrobromide ℥j. intravenously was given. After this the temperature did not rise above 100·6°; on the third day following the injection, it dropped to normal and remained there. There was a rapid improvement in condition, the animal was in good condition in a month from the date of injection, and started ordinary work; in another month was in excellent condition, very fit, and turned out one of the best horses in the regiment. There were no clinical symptoms of piroplasmosis and no parasites found on blood examination.

A. J. WILLIAMS, Lt.-Col. A.C.E.

Clinical and Case Reports.

The Editor will be glad to receive from members and others contributions to this column of reports of interesting cases

Notes on the Treatment of Equine Piroplasmosis, Pyrexia of Uncertain Origin, and Influenza, with Quinine Acid Hydrobromide (Yellow) Intravenously.*

See Cahrt on opposite page.

By Colonel A. J. Williams, F.R.C.V.S., D.S.O.

A five-year-old Australian remount joined an Indian Cavalry Regiment in April, 1915. In August the animal started losing condition and became anæmic, but nothing definite could be found to arsenic account for this. Various diets were tried, and and iron tonics given without any improve-ment.

On September 22nd pyrexia started, temperature up to 102°F, intermittent, but it never rose above 102.4°F. At first, ordinary febrifuges and salines were given, later quinine sulph. 1 dram. in bolus twice daily was tried for ten days without effect. By this time the animal was very debilitated and showed marked anæmia.

There were no clinical symptoms of piroplasmosis at any time and no piroplasms found on examination of the blood.

On October 28th an intravenous injection of quinine acid hydrobromide (yellow), one dram in one ounce of sterile water was given. After this the temperature did not rise above 100.6°; on the third day it dropped to normal and remained so.

The debility and anæmia rapidly improved, the animal started to feel well, in a month from the date of injection was in good condition and started ordinary work; after another month, was in excellent condition and very fit.

The attached clinical chart shows the type of fever and the marked effect of the quinine injection after ordinary treatment had failed to give any result.

In cases of debility and œdema occurring as sequelæ to piroplasmosis, where quinine treatment had not been used, and which did not yield to ordinary treatment, excellent results were obtained by the intravenous injection of quinine acid hydrobromide.

In many cases of persistent œdema of the limbs, which resisted treatment with pot. iod., digitalis, salines, etc., after one injection the œdema of the knees and hocks, which showed a special tendency to become chronic, disappeared, whereas cases treated in the ordinary way showed no improvement.

In the treatment of equine piroplasmosis excellent results have been obtained, *vide The Tropical Veterinary Bulletin*, No. 1, Vol. 4, of 1916, dated March 30th, 1916.

From 1914 to 1916, in India, 300 cases of piroplasmosis were treated, with only eleven deaths.

This form of treatment has also been carried out on Field Service in India, Mesopotamia and Aden, the drug being made up in 30 grain tablets.

During an outbreak of influenza in India in 1916, a 30 grain dose intravenously gave excellent results.

* Presented to the Central Veterinary Society's Meeting on January 11th, 1923.

Lactation in Virgin Mare.

From Chambers, Son & Dyson, M.R.C.V.S., Huddersfield.

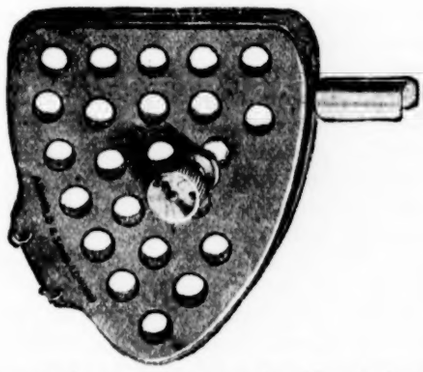
Subject.— *Virgin* harness mare, 16 years old, at present under treatment for lameness.

History.—The owner has kept her for the last few years as a pet, doing no work, well housed and liberally fed.

Feature.—She gives not less than a gallon of milk in the 24 hours. Some six months ago there was painful distension of the udder, and we advised fomentations and removal of milk—the latter has never been discontinued.

Ear Clamp for Cat and Dog.

By Henry Gray, M.R.C.V.S., 1 Redfield Lane, S.W.5.



Every veterinary surgeon who has had to treat *hæmatoma auris* or cystic condition of the flap of the ear, which is always, in my experience, due to the presence of the earmite, *symbiotes auricularum* in the ear cavity of the cat, knows only too well how unsatisfactory the results are after the condition has been treated by the means usually recommended. It is generally difficult, if not always impossible, to maintain pressure to the separated skin and perichondrium, and, in consequence, the cavity left after the serum and fibrinous clot are removed by incision of the cyst wall, rapidly fills again by the incision wound quickly closing up. This necessitates repeated reopening and finally the ear undergoes shrinkage, and is drawn down, leaving a permanent deformity and disfigurement.

This trouble may be prevented by the use of an ear-clamp made, at my suggestion, by Messrs. Arnold and Sons, Giltspur Street, E.C. This instrument is made of two flaps or wings of thin sheet aluminium, which has several perforations for aeration or drainage, or at least for lightening the weight of the appliance. The wings or flaps are, in outline, that of the free portion or flap of the ear, and are joined together at one side by small rings or a hinge and fastened at the

other end with a movable clip. They are kept in position on the ear by means of a small thumb screw, which is passed through a perforation in each flap and the thickness of the included ear flap.

Sufficient pressure is maintained just to keep the separated skin to the cartilage, and only for a few days until adhesion has taken place, when the instrument should be removed.

Before its application the internal ear is cleaned out and an effective parasiticide introduced to kill the ear mites. The cyst wall is incised its whole length, and after the serum has escaped the fibrinous clot is removed under antiseptic or, preferably, aseptic precautions. The ear is then freed from as much moisture as possible, and the clamp is applied. Too much pressure should not be used, else the circulation of the soft structures would be impeded and necrosis set up.

When the clamp is removed after two or three days application only a slight trace of the incision wound remains, and the ear flap appears otherwise normal. The ear does not pucker or shrink, and there is no drawing down of the organ. Treatment of the original trouble, parasitic canker, should be repeated a few times after intervals of a few days. Occasionally both ears are affected with cysts at the same time, or one within a short space of time of the other.

Although the same condition in the dog may be treated successfully by other means, a cure may be obtained with greater rapidity and certainty by a similar method of clamping—the clamps varying in size in relation to that of the animal affected.

Therefore, in ordering clamps, the dimensions of the area of the flap to be included in the two flaps or wings of the instrument should be given.

This instrument should also prove of value in the treatment of chronic ulceration, laceration or other wounds, accidental or surgical, of the ear flap.

New Castrating Clams for Cats.

By Henry Gray, M.R.C.V.S., 1 Redfield Lane, S.W.5.

Every practitioner who has castrated many cats must have found that several of them have died within a week of the operation. This is more especially seen in large fat or adult animals that have bled into the scrotum or have had the testicles with the cords forcibly drawn out. I have found, after many years' experience, that these deaths are diminished to the minimum by use of the actual cautery and clam, which prevents hæmorrhage and does not damage or lacerate the deeper tissues of the cord or their seats of origin. After using many patterns of clams for several years, and found they had drawbacks, I induced Messrs. Arnold & Sons to make me a pair with blades resembling those of the Hæmorrhoidal clamps and handles (those of the artery forceps with a catch). The length of the instrument is 6½ inches. This clam is applied to the cord as easily as a pair of artery forceps, and is as readily removed. To those who are engaged in practice among the smaller animals, and who wish to obviate undue risk of loss of the animal, and hence loss of prestige among their clients, I should recommend the method of castration by the clams and actual cautery.

Review.

New Veterinary Dictionary.

This new Veterinary Dictionary is being published in monthly parts, price 5 francs the part, and each part contains about 100 pages. It will consist of two volumes of about 1,200 pages, with 600 illustrations.

Veterinary medicine has made great strides in recent years. During the war the combating of contagious diseases—glanders, mange, tetanus, typhoid, epizootic lymphangitis, rabies—and subsequently foot-and-mouth disease and rinderpest on the continent, contributed in each case something new to the general body of veterinary knowledge.

In surgery there have been improvements in connection with war injuries; and generally, owing to the shortage of supplies during the war, problems such as the economic feeding of stock, refrigeration, etc., have all led to useful work being done. The years since the war have also been fertile in scientific and medical discoveries. Contagious diseases, serum therapy, vaccination, new medicines, methods of diagnosis, hygiene, have all been subject to modifications and improvements.

The new dictionary is brought entirely up to date, and for French readers is an excellent reference book, easy to consult, on the present state of veterinary knowledge. It will give the practitioner, the farmer and the stock-breeder useful guidance and an up-to-date review, accompanied with excellent illustrations, on all matters on which information is likely to be sought.

[*Nouveau Dictionnaire Vétérinaire*, Fontaine & Huguier, Paris, Librairie J. B. Baillière & Fils.]

Association Reports.

Central Veterinary Society.

A General Meeting of the Central Veterinary Society was held at the Royal College of Veterinary Surgeons, on Thursday, the 11th January, 1923, the President, Captain A. E. Willett being in the chair.

The following signed the attendance book:—Professors J. MacQueen and G. H. Wooldridge; Captain A. L. Wilson, Col. A. J. Williams; Messrs. J. Rowe, W. Perryman, H. D. Jones, W. N. Thompson, G. H. Livesey, R. J. Foreman; Majors G. Rees, Mogg and P. W. Dayer Smith; Messrs. J. Willett, E. L. Stroud, S. H. Slocock, F. W. Willett, F. H. Stainton, H. King, H. C. P. King, A. Cornish Bowden; Captains H. R. Allen and Hamilton Kirk; Messrs. E. Brayley Reynolds, P. S. Howard, G. Dunlop Martin, F. J. Bosworth, W. F. Widden, and J. F. Macdonald, *Hon. Secretary.*

Visitors: Messrs. J. P. Rice, R. L. Cornell, E. G. Langford, B. Walpole, C. N. Bridgeman, W. Brown and C. N. Thompson.

The report of the previous meeting not having been published, the reading of the minutes was deferred until the next meeting.

The SECRETARY read a letter from Mrs. Wood, thanking the Society for their letter of sympathy on the death of her husband, Captain D. H. Wood. The PRESIDENT proposed that a vote of sympathy be recorded on the minutes. Carried, all standing.

Regrets for non-attendance were received from Major Hobday, Col. A. Smith, Major Simpson, Captain F. Andrews, Mr. H. L. Roberts, of Ipswich, and Mr. J. W. MacIntosh.

CORRESPONDENCE.

The SECRETARY read a letter from Mr. J. B. Buxton, requesting the society to elect a delegate to the Committee which will discuss the Dairies Order.

Owing to the urgent necessity for electing this delegate, it was decided to appoint one at the meeting, and the President was duly asked to represent the Society, on the proposition of Mr. FOREMAN, seconded by Major REES-MOGG. Carried unanimously.

ELECTION OF FELLOWS.

Captain Stow Young, M.C., Captain F. J. Andrews, B.Sc., and Mr. R. L. Cornell, B.Sc., were unanimously elected Fellows of the Society.

Mr. G. H. LIVESEY proposed and Mr. J. B. BUXTON seconded the nomination of Mr. W. Brown, of Welwyn Garden City, as a Fellow of the Society.

Major F. HOBDAY proposed and Mr. J. W. MACINTOSH seconded the nomination of Professor A. B. Mattinson as a Fellow of the Society.

ELECTION OF REPRESENTATIVES TO THE N.V.M.A.

The Secretary read the Bye-law governing the number of representatives.

Professor MCQUEEN: I understand this Society is a division of the National Veterinary Medical Association, and if that is so, do the rules and regulations of the National Veterinary Medical Association apply to us? The Secretary read one of the rules of the National, and what I wish to know is if the rules of this Society have been brought into line with those of the National?

Professor WOOLDRIDGE: Each division retains its independence, and makes its own rules independent of the National; but, of course, the aims are similar, and the rules of each should as far as possible harmonise.

Mr. J. B. Buxton has just resigned the position of Secretary of the National, and as a result, is no longer on the Council of that body; I think it would be very fitting if we elected him one of our delegates and I propose him accordingly.

The following were elected to represent the Society: The President, Mr. J. McIntosh, Col. Williams, Mr. S. H. Slocock, Mr. J. B. Buxton, Mr. G. H. Livesey and the Secretary.

Mr. G. H. LIVESEY: You have all heard that Mr. J. B. Buxton has retired from his position as Secretary of the National, and I think we should take this—the first—opportunity to pass a resolution of appreciation of the good work he has done.

I beg to move "That this Central Division of the National Veterinary Medical Association, Ltd., on learning of the retirement of Mr. J. Basil Buxton from the post of General Secretary, desires to place on record its recognition of the work which he has done for the benefit of the Association, and to express its appreciation of his unfailing courtesy and attention both to this Division and to individual members. That a copy of this resolution be sent to Mr. Buxton and to the National Veterinary Medical Association."

In proposing this resolution I should like to refer to the very excellent work Mr. Buxton has done for us. He stepped into the breach after the sad loss of Mr. Malcolm on whom so much hope rested, and took on the very difficult task of General Secretary.

He adapted himself to a post for which his inclination and training in no way prepared him, with always a cheerful face in spite of innumerable difficulties. He did everything in his power to help forward the welfare of the National, and no single member will ever know the full extent of his work.

Moreover, we have to thank him for equipping the office at his own expense, with furniture, electric light fittings, etc., and typewriter, and assisting the Association in every possible way. (Applause.)

Mr. J. WILLETT: As a member of the Editorial Committee of the National, I have great pleasure in seconding the motion.

This resolution was carried unanimously amid loud applause.

EXHIBITS.

Captain H. KIRK: It may interest the Fellows if I pass round for inspection, what, to me, is something of an innovation. It consists of a sterilised suture needle ready threaded with silk or gut, and contained in an hermetically-sealed glass tube filled with alcohol. We frequently have to perform emergency operations, and the possession in one's waistcoat pocket of sterile suture-material ready for instant use must

surely be a boon. They may be purchased at 6/6 per dozen.

Colonel A. J. WILLIAMS then favoured the meeting with "Notes on the Treatment of Equine Piroplasmosis, Pyrexia of uncertain origin, and Influenza, with Quinine Acid Hydrobromide (Yellow) intravenously," passing round for inspection an illustrative chart.

(Colonel Williams' Notes and Chart appear in our Clinical columns.—Ed.)

Captain DUNLOP MARTIN asked whether mucilage or water was used for injection.

Colonel WILLIAMS replied "Water."

The PRESIDENT: We are very much indebted to Colonel Williams and Captain Kirk for bringing these forward. These are the sort of subjects we want to further the interests of the Society.

Professor MACQUEEN: I should like to ask a question. I should like to know, for my own information, whether the Executive have arranged the future programme of these Meetings.

It is a point on which I feel very strongly. For the past two years the Society has been running about, and I think after this interval this Society may very well revert to clinical matters. I have spoken to many practitioners as to the subjects which are discussed at our meetings, and they have expressed regret that the clinical side of veterinary medicine has been left out of the programme of the Society. If this Society is likely to pursue the policy of the past two years, I shall endeavour to start a Clinical Society devoted to veterinary practice. There is an excellent opening for such a society.

Mr. J. WILLETT: I am sure we all welcome the presence of Professor MacQueen here to-night, and I think there are a great many of us in sympathy with his aims and what he has just stated.

I feel it would be very much better if Professor MacQueen, instead of starting a new society, were to help us to get back to old conditions, and the return to discussions we used to have. Probably he may be persuaded to initiate one in the immediate future.

The PRESIDENT: I do not think this Society has any particular programme to go upon, we have to reply upon the kindness of the Fellows; but I must say that I have enjoyed even the last two years. There is no doubt that the clinical side wants ventilating tremendously, and under this heading I should like to give my idea about the management of papers. It has been suggested, and I agree, that a paper should last on an average about thirty minutes, and the gentleman who opens the discussion should occupy ten minutes, and five minutes should be allowed to each Fellow taking part. In this way we would be able to hear many more views on the particular subject. The suggestion made by Professor MacQueen is a very sensible one, and, personally, I think we should all endeavour to introduce the clinical side into our discussions as much as possible.

Colonel WILLIAMS: I should like to support the suggestion with regard to increasing the amount of clinical matter brought forward for discussion.

I think it should be one of the most important points of our meetings, and we cannot have too much of it.

I introduced the short clinical note this evening on the subject of intravenous medication and the keeping of complete clinical charts, in the hope that it would prove of general interest, and also give rise to fruitful discussion.

The SECRETARY: I shall be very pleased to give Professor MacQueen an opportunity to read us a paper on the lines he suggests. I have plenty of open dates and he can select any meeting which suits him. (Applause).

CONTINUED DISCUSSION ON MAJOR REES-MOGG'S PAPER.

Captain DUNLOP MARTIN: When I proposed last meeting that the discussion on this subject should be adjourned, I had no idea that I should be called upon to open the discussion, for the reason I have nothing fresh to speak upon; therefore I feel that I ought to apologise to the meeting.

There is just one point in regard to sclerostomes in young horses that I should like to mention. I remember in Essex having a lot of trouble owing to the low lying marshes, and a drug thought very useful was the powdered bark of pomegranate root, and I should like to know whether any of the Fellows have had any experience of this drug.

Captain KIRK: With reference to sclerostomiasis, my greatest experience of the disease was gained during the war, but particularly at a veterinary hospital in Wales, where great numbers of the patients were just skeletons, and dying daily.

Those of you who read *The Veterinary Journal* may recollect a somewhat lengthy article which I contributed in 1918 on the question of sclerostomes and aneurisms.

It has been frequently asserted by veterinary surgeons that these worms do no appreciable damage, though I feel quite convinced they do. Perhaps I may be allowed to read a short extract from the article alluded to.

> "Just before I left France, a certain light draught horse died in the early hours one morning, having been up the line with rations the previous night. By the time I arrived to make my autopsy, the veterinary sergeant had removed the skin and made an incision down the median line of the abdomen. Upon exposing the viscera, a perforation of the large colon could at once be seen, which the Transport Officer mistook for a bullet wound. In the absence of any hole in the skin or muscles, however, this was negatived, and I had the bowels removed, this disclosing two other perforations, one in the large and one in the small intestine. Round each of these holes was a black ring of inflamed and necrosed tissue, measuring roughly 1½ inches across, and prior to the perforation these centres had without doubt been ulcers. I searched for their cause, but could find nothing except hundreds of sclerostomes, which may, or may not, have been the origin of the trouble. I

was strongly suspicious, however, and finally concluded that it was the inflammation set up by these parasites which caused the ulcers, and ultimately perforation, peritonitis, and death. The ascertained history of this horse was to the effect that no untoward symptom of any kind had been noticed prior to death, with the sole exception that he was a 'bad doer.' In a veterinary hospital in France I many times found these parasites in the alimentary tracts of dead debility horses, though at that time I had not thought so seriously of it as I do now.

"Just recently I have passed a period of temporary duty at a mange hospital in the Aldershot Command, and at the time I was there perhaps 80 per cent. of the cases were also debilitated. Many were extremely thin, and on a particular occasion an eight-year-old mule got down, and owing to excessive weakness and partial paralysis of the hind quarters was ultimately destroyed. I made a *post-mortem* and discovered four distinct types of worms: (1) *Filaria papillosa* (5 inches long), which is uncommonly met with free in the intestine; (2) *Sclerostomum equinum*; (3) *S. tetracanthum*; and (4) a small unnamed grub-like parasite about $\frac{1}{3}$ inch long. The sclerostomes were everywhere in abundance, and in this particular case were nearly all copulating, and found attached to each other at the caudal extremity. At another veterinary hospital where there had been many deaths, which upon *post-mortem* had been recorded as due to 'parasitic enteritis, accompanied by marasmus.' the presence of sclerostomes was everywhere manifest, and no *post-mortem* held upon any animal which had suffered from debility and emaciation could fail to reveal them, either in scores or in tens of thousands. In a great many cases aneurisms of the mesenteric and colic arteries were found, in various stages of development, and always containing several sclerostomes. One aneurism, which had been preserved, had assumed the size of a sheep's heart, and in a rare instance I know of one attaining the size of a horse's heart. Small ones, however, were very common, and undoubtedly gave rise to many of the cases of colic with which we were troubled, and which prior to *post-mortem* could not be accounted for. Some outstanding symptoms may be noted in horses affected with sclerostomiasis, and these are: Arching of the back and loins; capricious appetite; signs of emaciation from slight to extreme; occasionally a rise in temperature up to about 103°, and sometimes (but in my experience only rarely) constipation, alternating with diarrhœa. In cases where these parasites have set up an aneurism, complicated by the formation of one or more emboli, there will be frequent attacks of colic, each usually of short duration.

Yesterday I held a *post-mortem* on a horse which had shown all these symptoms, and the large colon presented a sight which, had it been described to me without visual confirmation, I would never have believed. The ingesta within it was a writhing mass of sclerostomes, and in some places there were solid conglomerations of the size of an orange, entirely composed of these worms. An egg-sized aneurism was also present in the great mesenteric artery, and it needs no second thought to realise that the presence of the aneurism and its clot in this situation reduces the calibre of the above artery, and so diminishes the supply of blood to the intestine, which is sufficient to explain the chronic indigestion observed. It seems, therefore, conclusively proved that these sclerostomes are the cause of great havoc and loss among equines, and deserve the closest investigation, both as to their origin and the means of eradication. I have tried many of the most favoured anthelmintics, but cannot claim as yet to have discovered any reliable cure."

Now as to treatment, all I could effect at the Welsh hospital was the provision of ordinary rock salt, practically no drugs being available. This, together with green grass from the mountain slopes did a remarkable lot of good. It appears to me, however, that the line of treatment which is most likely to lead to success in the eradication of worms outside the lumen of the alimentary canal, is by intravenous injection. Drugs given per os will never so effectively reach the worms in the aneurisms as will drugs injected directly into the blood stream. What drug shall be used, however, is a question that can only be decided in the future by constant experiment, though I am sanguine that before long a reliable treatment will be discovered. (Applause.)

Colonel WILLIAMS: With reference to the article read by Captain Kirk, I think it has generally been considered that invasion of the circulatory system by the larvæ of the *strongylus armatus* produces fatal results, but that the *sclerostomum tetracanthum* is not so dangerous.

I would like to make a few remarks regarding equine parasites met with in India, and will adhere to the old nomenclature. Sclerostomes, ascarides, oxyurides, spiroptera, and the larvæ of the *Gastrophilus equi*, are often found in considerable numbers when making *post-mortem* examination of horses, without there being any apparent ill effects as the result of their presence, and very few deaths could be traced as a direct result of parasitism.

In my experience spiroptera cause more trouble in India than the other parasites mentioned.

I have seen a case of gastro-splenic fistula following gastric ulceration resulting from a verminous tumour.

Incurable cases of debility also seem due to a massive infection of a parasitic nature affecting the liver and intestinal glands. The liver is found enormously enlarged, up to 30 lbs. in a mule and 90lbs. in a horse—a calcareous degenerated mass; cutting through it was like sawing through sandstone. I was unable to ascertain the true nature of this infection, which appeared to be a cystic one.

In a unit badly infested with ascarides and oxyurides, anthelmintic treatment, together with the

surely be a boon. They may be purchased at 6/6 per dozen.

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It is a point on which I feel very strongly. For the past two years the Society has been running about, and I think after this interval this Society may very well revert to clinical matters. I have spoken to many practitioners as to the subjects which are discussed at our meetings, and they have expressed regret that the clinical side of veterinary medicine has been left out of the programme of the Society. If this Society is likely to pursue the policy of the past two years, I shall endeavour to start a Clinical Society devoted to veterinary practice. There is an excellent opening for such a society.

Mr. J. WILLETT: I am sure we all welcome the presence of Professor MacQueen here to-night, and I think there are a great many of us in sympathy with his aims and what he has just stated.

I feel it would be very much better if Professor MacQueen, instead of starting a new society, were to help us to get back to old conditions, and the return to discussions we used to have. Probably he may be persuaded to initiate one in the immediate future.

The PRESIDENT: I do not think this Society has any particular programme to go upon, we have to reply upon the kindness of the Fellows; but I must say that I have enjoyed even the last two years. There is no doubt that the clinical side wants ventilating tremendously, and under this heading I should like to give my idea about the management of papers. It has been suggested, and I agree, that a paper should last on an average about thirty minutes, and the gentleman who opens the discussion should occupy ten minutes, and five minutes should be allowed to each Fellow taking part. In this way we would be able to hear many more views on the particular subject. The suggestion made by Professor MacQueen is a very sensible one, and, personally, I think we should all endeavour to introduce the clinical side into our discussions as much as possible.

Colonel WILLIAMS: I should like to support the suggestion with regard to increasing the amount of clinical matter brought forward for discussion. I think it should be one of the most important points of our meetings, and we cannot have too much of it.

I introduced the short clinical note this evening on the subject of intravenous medication and the keeping of complete clinical charts, in the hope that it would prove of general interest, and also give rise to fruitful discussion.

The SECRETARY: I shall be very pleased to give Professor MacQueen an opportunity to read us a paper on the lines he suggests. I have plenty of open dates and he can select any meeting which suits him. (Applause).

CONTINUED DISCUSSION ON MAJOR REES-MOGG'S PAPER.

Captain DUNLOP MARTIN: When I proposed last meeting that the discussion on this subject should be adjourned, I had no idea that I should be called upon to open the discussion, for the reason I have nothing fresh to speak upon; therefore I feel that I ought to apologise to the meeting.

There is just one point in regard to sclerostomes in young horses that I should like to mention. I remember in Essex having a lot of trouble owing to the low lying marshes, and a drug thought very useful was the powdered bark of pomegranate root, and I should like to know whether any of the Fellows have had any experience of this drug.

Captain KIRK: With reference to sclerostomiasis, my greatest experience of the disease was gained during the war, but particularly at a veterinary hospital in Wales, where great numbers of the patients were just skeletons, and dying daily.

Those of you who read *The Veterinary Journal* may recollect a somewhat lengthy article which I contributed in 1918 on the question of sclerostomes and aneurisms.

It has been frequently asserted by veterinary surgeons that these worms do no appreciable damage, though I feel quite convinced they do. Perhaps I may be allowed to read a short extract from the article alluded to.

> "Just before I left France, a certain light draught horse died in the early hours one morning, having been up the line with rations the previous night. By the time I arrived to make my autopsy, the veterinary sergeant had removed the skin and made an incision down the median line of the abdomen. Upon exposing the viscera, a perforation of the large colon could at once be seen, which the Transport Officer mistook for a bullet wound. In the absence of any hole in the skin or muscles, however, this was negatived, and I had the bowels removed, this disclosing two other perforations, one in the large and one in the small intestine. Round each of these holes was a black ring of inflamed and necrosed tissue, measuring roughly 1½ inches across, and prior to the perforation these centres had without doubt been ulcers. I searched for their cause, but could find nothing except hundreds of sclerostomes, which may, or may not, have been the origin of the trouble. I

was strongly suspicious, however, and finally concluded that it was the inflammation set up by these parasites which caused the ulcers, and ultimately perforation, peritonitis, and death. The ascertained history of this horse was to the effect that no untoward symptom of any kind had been noticed prior to death, with the sole exception that he was a 'bad doer.' In a veterinary hospital in France I many times found these parasites in the alimentary tracts of dead debility horses, though at that time I had not thought so seriously of it as I do now.

"Just recently I have passed a period of temporary duty at a mange hospital in the Aldershot Command, and at the time I was there perhaps 80 per cent. of the cases were also debilitated. Many were extremely thin, and on a particular occasion an eight-year-old mule got down, and owing to excessive weakness and partial paralysis of the hind quarters was ultimately destroyed. I made a *post-mortem* and discovered four distinct types of worms: (1) *Filaria papillosa* (5 inches long), which is uncommonly met with free in the intestine; (2) *Sclerostomum equinum*; (3) *S. tetracanthum*; and (4) a small unnamed grub-like parasite about $\frac{1}{3}$ inch long. The sclerostomes were everywhere in abundance, and in this particular case were nearly all copulating, and found attached to each other at the caudal extremity. At another veterinary hospital where there had been many deaths, which upon *post-mortem* had been recorded as due to 'parasitic enteritis, accompanied by marasmus,' the presence of sclerostomes was everywhere manifest, and no *post-mortem* held upon any animal which had suffered from debility and emaciation could fail to reveal them, either in scores or in tens of thousands. In a great many cases aneurisms of the mesenteric and colic arteries were found, in various stages of development, and always containing several sclerostomes. One aneurism, which had been preserved, had assumed the size of a sheep's heart, and in a rare instance I know of one attaining the size of a horse's heart. Small ones, however, were very common, and undoubtedly gave rise to many of the cases of colic with which we were troubled, and which prior to *post-mortem* could not be accounted for. Some outstanding symptoms may be noted in horses affected with sclerostomiasis, and these are: Arching of the back and loins; capricious appetite; signs of emaciation from slight to extreme; occasionally a rise in temperature up to about 103°, and sometimes (but in my experience only rarely) constipation, alternating with diarrhœa. In cases where these parasites have set up an aneurism, complicated by the formation of one or more emboli, there will be frequent attacks of colic, each usually of short duration.

Yesterday I held a *post-mortem* on a horse which had shown all these symptoms, and the large colon presented a sight which, had it been described to me without visual confirmation, I would never have believed. The ingesta within it was a writhing mass of sclerostomes, and in some places there were solid conglomerations of the size of an orange, entirely composed of these worms. An egg-sized aneurism was also present in the great mesenteric artery, and it needs no second thought to realise that the presence of the aneurism and its clot in this situation reduces the calibre of the above artery, and so diminishes the supply of blood to the intestine, which is sufficient to explain the chronic indigestion observed. It seems, therefore, conclusively proved that these sclerostomes are the cause of great havoc and loss among equines, and deserve the closest investigation, both as to their origin and the means of eradication. I have tried many of the most favoured anthelmintics, but cannot claim as yet to have discovered any reliable cure."

Now as to treatment, all I could effect at the Welsh hospital was the provision of ordinary rock salt, practically no drugs being available. This, together with green grass from the mountain slopes did a remarkable lot of good. It appears to me, however, that the line of treatment which is most likely to lead to success in the eradication of worms outside the lumen of the alimentary canal, is by intravenous injection. Drugs given per os will never so effectively reach the worms in the aneurisms as will drugs injected directly into the blood stream. What drug shall be used, however, is a question that can only be decided in the future by constant experiment, though I am sanguine that before long a reliable treatment will be discovered. (Applause.)

Colonel WILLIAMS: With reference to the article read by Captain Kirk, I think it has generally been considered that invasion of the circulatory system by the larvæ of the *strongylus armatus* produces fatal results, but that the *sclerostomum tetracanthum* is not so dangerous.

I would like to make a few remarks regarding equine parasites met with in India, and will adhere to the old nomenclature. Sclerostomes, ascarides, oxyurides, spiroptera, and the larvæ of the *Gastrophilus equi*, are often found in considerable numbers when making *post-mortem* examination of horses, without there being any apparent ill effects as the result of their presence, and very few deaths could be traced as a direct result of parasitism.

In my experience spiroptera cause more trouble in India than the other parasites mentioned.

I have seen a case of gastro-splenic fistula following gastric ulceration resulting from a verminous tumour.

Incurable cases of debility also seem due to a massive infection of a parasitic nature affecting the liver and intestinal glands. The liver is found enormously enlarged, up to 30 lbs. in a mule and 90lbs. in a horse—a calcareous degenerated mass; cutting through it was like sawing through sandstone. I was unable to ascertain the true nature of this infection, which appeared to be a cystic one.

In a unit badly infested with ascarides and oxyurides, anthelmintic treatment, together with the

burning of all fæces, stopping grazing and feeding on green grass, gave excellent results.

Animals suffering from parasitism usually show symptoms of pica and will eat fæces at every opportunity; therefore immediate removal of droppings from stables is an important preventive measure.

Filaria oculi are commonly present in cases of kumri, but it is thought that their presence is only fortuitous.

Early removal by operation is essential to prevent incurable eye lesions.

With regard to the outbreak of sclerostomiasis in Ireland, Colonel Todd reported that the mixture mentioned by him, administered by stomach tube after 36 hours' starvation, and repeated monthly as necessary, was the only treatment which resulted in the expulsion of the mature and immature parasites in large numbers, and that in about 50 per cent. of the cases, where no improvement was effected, there was a want of co-ordination of the muscles of the hind quarters, pointing to a parasitic toxæmia.

I think administration of a vermifuge with large quantities of fluid is treatment on sound lines, as by this means the ingesta is broken up and the vermifuge has free action on the parasites.

With reference to the two photographs (passed round), the animal (a private charger) arrived in England in March, 1921, from Ireland, where it had been running at grass for about a year. On arrival the animal was so weak that she could hardly walk from the station. After about two months' careful feeding the owner started hacking her for about forty minutes daily, but she remained in very poor condition. She was then roughed up from August till October, but remained in a very debilitated condition.

When I saw her in August I suspected sclerostomiasis, which was very prevalent in Ireland. The owner said no worms had been seen, but thousands of what he thought to be eggs had been passed at various times.

Various anthelmentics, arsenic and iron tonics, and dieting were tried, but no improvement in condition resulted. After reading an article in which oil of chenopodium was recommended I decided to give it a trial; the animal was starved for 24 hours and 4 drachms of oil of chenopodium given in 4 ounces of linseed oil, followed in three hours by 1 ounce of oil of turpentine in 1 pint of linseed oil.

Some sclerostomes were evacuated, but the animal still showed no improvement in spite of careful dieting. The owner decided to have the animal destroyed, but at my request it was sent to the R.A.V. School, Aldershot, on 5th November, 1921, for experimental treatment.

Mallein and tuberculin testings were carried out, blood count normal.

On 14th December, oil of chenopodium, 5 drachms, was given in linseed oil after 36 hours' starvation.

No parasites of any kind were found in the fæces after this treatment.

The animal was then given an ordinary diet of oats and bran, together with 1lb. of swedes daily for twenty days.

On admission to the R.A.V. School the body weight was 896 lbs., when discharged on 21st February, 1922, it had increased to 1,204 lbs.—an increase of 308 lbs. in 105 days, an average gain of 90 lbs. per month. A really striking result. (Applause.)

Mr. W. PERRYMAN: I am certainly indebted to Major Rees-Mogg for his excellent paper, but I am not sure he has taught anything new.

I am very sorry that the report of the last meeting has not been published, as I wished to read it up for this meeting, and I was unable to follow all the remarks of the essayist at the last meeting.

The subject affects country more than town practitioners, and I think the best way to understand this subject is to get down to its life history. We hear of cases treated with various remedies, but we want to get to the beginning of the complaint. Of course the country practitioner comes into contact more with these parasites. I do think more enquiries should be made in regard to its life history, and the habitat of the various parasites, and that it is essential to treat pastures to get rid of ovæ and embryos.

I think the Board of Agriculture and Government should devote a certain sum of money to educate stockowners as to how to prevent these parasites; but, of course, if this plan were adopted it would not affect small so much as large stockowners.

The treatment suggested by Major Rees-Mogg is a very expensive one, and I am afraid could only be used in isolated cases. Probably the cost of the remedy Colonel Williams suggests would prevent it being adopted largely. Thymol is 3/- an oz.; but that just referred to by Colonel Williams, chenopodium, is 2/6 per oz., therefore, a draught made with this drug would be a great deal too expensive for the ordinary horse-owner.

In London one finds more cases of *Ascaris megalocephala* and *Oxyuris curvula* than of other kinds of internal parasites.

With regard to treatment, I am greatly in favour of turpentine given in conjunction with chloroform and linseed oil, also sulphate of iron given in large doses, and continued until the deposit shows in the fæces, that is, until they become black. I have found this treatment gives excellent results.

I was pleased to hear Captain Kirk mention the administration of rock-salt. I think common salt always ought to be used if the animal is affected with worms.

I think we ought to endeavour to obtain Government grants to carry out further original research. Many thousands of pounds are lost annually through these parasites, and it would be a real economy if the State were to devote money to deal with this very important subject.

Major REES-MOGG: I have to thank you very much for the nice things you have said about my paper. My sole object was to raise a discussion, and in this I think I have succeeded.

Captain Daubenay said that it was very necessary to keep on examining the fæces. I found out this to my cost. One day after treating a patient which I considered was quite cured, I found five or six little red worms in the fæces, and on a subsequent occasion I found the same result, therefore I quite agree the fæces should be most carefully examined for some time after the treatment.

As regards the *Oxyuris curvula*, I think that injections of salt do good.

As regards numbers of worms, I have found thousands of *Ascaris megalocephala* twisted up in the bowels without doing any apparent harm to the animal.

Once more I have to thank you, Mr. President and Fellows, for the very kind way in which you have received my paper.

Professor G. H. WOOLDRIDGE then presented a paper on "Chloroform Anæsthesia in Menagerie Patients."

(This paper, together with the ensuing discussion, receives separate publication.—Ed.).

Mr. S. H. SLOCOCK: I beg to propose a very hearty vote of thanks to the essayists for their most interesting papers. I am sure we have all benefited very considerably, listening to them, and to the discussions.

A vote of thanks to the President terminated the proceedings.

National Veterinary Medical Association.

SPECIAL MEETING OF COUNCIL.

A special meeting of the Council of the N.V.M.A. will be held at 10 Red Lion Square, W.C., on Monday next, February 12th, at 3 p.m. All members of Council are urged to make an effort to be present, as matters of great importance on the organisation are to be discussed.

Notes and News.

The Editor will be glad to receive items of professional interest in these columns.

Obituary.

PROFESSOR A. I. LOCUSTEANO.

We learn with deep regret from *Archiva Veterinara* (No. 5, 1922) of the death of Professor Locusteano, which occurred on November 9th, in his 75th year. He was the outstanding figure in the veterinary profession in Roumania, having been Director of the High School of Veterinary Medicine at Bucarest for more than 20 years, during which time the school was rebuilt and enlarged by the addition of a Zootechnic Institute. Locusteano was the founder of the Veterinary Service of the Roumanian Ministry of Agriculture, and its first Chief. He established the Veterinary Medical Society in 1892, and was at his death its President d'Honneur. He was also the first President of the General Association of Veterinary Surgeons, founded in 1915. He retired from the Principalship of the School in 1910 owing to ill-health, but continued to take an active interest in all matters affecting the profession. He was one of the founders of the *Archiva Veterinara* in 1904, and has been one of its most frequent contributors. Professor Locusteano was elected an Honorary Associate of the Royal College of Veterinary Surgeons in 1883. We express to our Roumanian confrères our profound sympathy in the loss which they have sustained.

MR. J. W. POLLOCK.

The death has occurred suddenly at Wellhall Road, Hamilton, of Mr. James Pollock, M.R.C.V.S., who was 75 years of age. Mr. Pollock, who was a well-known practitioner, had practised in the Hamilton district for half a century, and had an extensive connection among the agricultural community.

HUMPHREY.—On 31st January, 1923, at 23 Beechfield Road, Catford Hill, S.E.6, Charles J. Humphrey, F.R.C.V.S. (dearly loved husband of Edith L. Humphrey), late Veterinary Inspector for the London County Council. Cremated at West Norwood by his own desire, February 3rd, 1923.

MCQUEEN, JOHN, 6 Cumberland Street, S.S., Glasgow. Graduated Glasgow, 16th April, 1873. Died 29th January, 1923. Aged 70.

PERSONAL.

BIRTH.—*Beaumont.* On January 27th, at Old Park House, Bishop's Castle, Shropshire, to the wife of Ernest Beaumont, a daughter.

Animal Diseases Research.

OFFER OF £30,000 TO CAMBRIDGE UNIVERSITY.

The Council of the Senate of Cambridge University have presented a report on the offer of the Ministry of Agriculture to establish an Institute of Animal Pathology, which has been a long-felt want, and they recommend that the offer of £30,000 to found a Professorship of Animal Pathology as a first step towards the creation of an Institute for Research in the pathology of animal diseases should be accepted by the University, subject to the conditions stated in the report.

The Commissioners are not in a position to recommend any assistance towards expenditure in the study of animal diseases from funds other than the Corn Production Acts Repeal Act Fund, which is expected to be exhausted about 1927, but they would afterwards be prepared to consider the whole financial situation, and the Council, therefore, suggest a proviso that the University should have no

obligation to continue the Institute after 1927, unless satisfactory financial provision is assured.

[We think it highly desirable that the post of Professor of Animal Pathology should be held by a veterinary surgeon, and we hope that steps will be taken before it is too late to see that a recommendation to that effect is made to the proper quarter.—Ed.]

Drovers fined for Neglect.

At the Norwich Police Court last week five drovers were fined for causing unnecessary suffering to bullocks and sheep by omitting to give them adequate food and attention on their journey outward from the Cattle Market to the country.

Mr. E. Reeve prosecuted for the R.S.P.C.A., and in opening he said defendants were all drovers employed by farmers to drive beasts and sheep to their destinations after the market. Sometimes drovers could get away early, and sometimes they had to put the animals up overnight, starting on their journey on the Sunday morning. All the animals in question were put up at the Black Horse, Sprowston. They were put in lairs that were wet, and in which it was not possible for them to lie down. Inspector Oxby, with a veterinary surgeon and a police officer, went to the Black Horse on December 3rd at 5-30 a.m. The bullocks were bellowing and were "tucked up." The Inspector ordered food to be given to them, and this they ate ravenously, and it was quite clear that the animals had been starved for a time. One could imagine, said Mr. Reeve, the state the animals were in. They had no food on the Hill, and very little on the Saturday evening. In one case 59 bullocks were in a pen which had six inches of mud and water, and they devoured two trusses of hay in less than five minutes. When seen the drovers said only 3d. a night was allowed for each bullock, and 1d. a night for sheep.

Inspector Oxby bore out counsel's statements, and said he saw Gibbs, who said the farmers would not pay more than 3d. a night. Other defendants said the farmers only allowed a 1d. a night for sheep.

H. Buckingham, a veterinary surgeon, of 20 West Parade, Norwich, said he saw all the animals in question at the Black Horse on December 3rd. They were suffering from the condition of the pens, and from not having had food.

All five defendants said they had nothing at all to say.

Later defendant Gibbs said the farmers allowed 3d. for a bullock and 1d. for a sheep. The animals were left in the care of the landlord of the public-house. Defendant Goodson said he was a regular drover, but in these days there were so many unemployed looking for a job that the regular drovers had to accept a smaller sum than ever in order to get a job.

The Chairman said it was a difficult case, but they must convict. Defendants would be fined 6s. each, and 10s. 6d. costs each. Commenting upon the case the *Norwich Daily Press* says: "The batch of cases heard at Norwich police court yesterday reveals a very serious state of things. These animals, it appears, are put up outside Norwich on the Saturday night, starting on the rest of the journey to their destinations on the Sunday morning. The provision made in these cases for feeding and attending to the animals during this overnight lodgment on the road was deplorably inadequate; the seriousness of the cases is not in themselves only, but in the fact that they suggest a regular practice. The matter is one for which the remedy primarily rests, not with the drovers, but with the farmers who settle the arrangements under which beasts are conveyed to their destinations after the market."

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.
All correspondence must bear the name and address of the contributor for publication.
The Editor does not hold himself responsible for the opinions of his correspondents.

Certified "Grade A" (Tuberculin Tested) Milk.

Sir,—Mr. Taylor's letter pointing out the multiplicity of hours required for temperature registration, *viz.*: 6th, 9th, 12th, 15th, 18th, and 21st hour, under the above scheme will certainly save veterinary surgeons annoyance, but it will at the same time cause them considerable apprehension. Those men who have a lot of testing to do will have very little time in their beds.

Tuberculin is generally infected in the evening to enable animals to rest undisturbed through the night, but this is impossible under the above plan, no matter at what time one starts. In my experience, the most important temperatures are at the 12th and 15th hours, and if a tuberculous animal has a temperature at the 6th hour, it will have it at the 12th, and a good many hours after. The taking at the 6th and 9th hour is a waste of time.

It would be interesting to have the views of Mr. Manuel or some other testing expert.—Yours sincerely, J. Forbes.

Truro, *February 5th*, 1923.

Army Veterinary Service.

London Gazette—War Office—Regular Forces.

January 30th.—Captain J. G. E. Gallie is placed on the h.p. list on account of ill-health (January 30th).

Regular Army Reserve of Officers.

January 30th.—Captain W. W. Henderson, late R.A.V.C. Mila., to be Captain (November 4th, 1922), with seniority, October 20th, 1919.

Indian Army.

The following officers held and are holding appointments on staff of Waziristan Field Force:—

February 2nd.—Deputy Director of Veterinary Services.—Major (temp. Lt.-Col.) E. B. Bartlett, O.B.E., R.A.V.C., from October 1st, 1919, to July 19th, 1920.

Assistant Directors of Veterinary Services.—Major (temp. Lt.-Col.) H. Greenfield, R.A.V.C., from July 20th, 1920, to July 3rd, 1921; Major and Bt. Lt.-Col. (temp. Lt.-Col.) J. J. Aitken, C.M.G., D.S.O., R.A.V.C. (July 4th, 1921).

Deputy Assistant Directors of Veterinary Services.—Major W. W. R. Neale, O.B.E., R.A.V.C., from October 1st, 1919, to August 9th, 1921; Major H. Greenfield, R.A.V.C., from April 10th to July 19th, 1920; Captain (temp. Major) J. J. Mills, R.A.V.C., from November 7th to 15th, 1920, and from February 11th to June 15th, 1921; Captain (temp. Major) D.A. S. Beck, R.A.V.C., from November 16th, 1920, to February 10th, 1921; Major L. M. Verney, D.S.O., R.A.V.C. (August 10th, 1921).